Problem of the Week #9
### (Fall 2019)

The points (x, y, z, w) in four-dimensional space such that $-1 \leq x, y, z, w \leq 1$ form a *hypercube H*. A two-dimensional projection of H is shown below.

The points in H with $x = 1$ comprise a *facet* of H. H has a total of eight facets; each is made up of the points in H with a certain coordinate equal either to -1 or to 1. Each facet of H is a cube with eight vertices.

Arrange the integers $1, 2, 3, \ldots, 16$ at the vertices of H so that:

- each integer is used exactly once, and

- the integers at the vertices of each facet sum to 68.
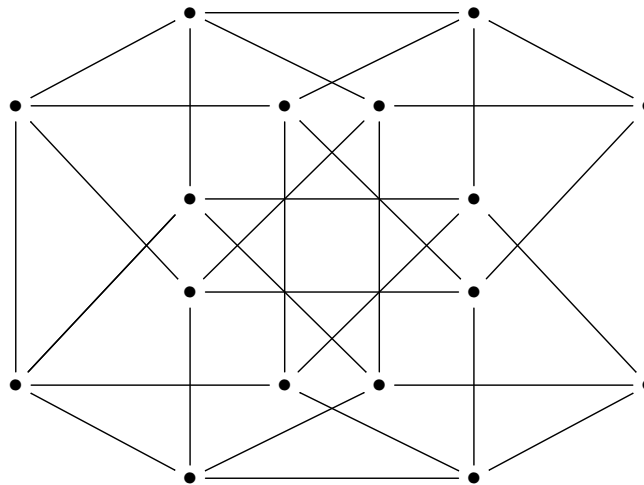
[Please fully explain your answer.]

Solutions should be submitted to Cinda Furry, in Gardner Hall 435, by 4:00 P.M. on Wednesday, November 20, 2019.

Every week, the best solution submitted earns a \$10 Platteville gift certificate; the top scorer each semester also wins a cash award. Good luck!

You can always see the Problem of the Week (and complete rules) online at:

http://uwpmath.weebly.com/